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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference 57765 WO 003	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/US 03/14468	International filing date (day/month/year) 06.05.2003	Priority date (day/month/year) 28.06.2002
International Patent Classification (IPC) or both national classification and IPC B23K26/38		
Applicant 3M INNOVATIVE PROPERTIES COMPANY ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).
- These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 23.01.2004	Date of completion of this report 07.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Christensen, J Telephone No. +31 70 340-2437 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/US 03/14468**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*):

Description, Pages

1-22 as originally filed

Claims, Numbers

1-14 as originally filed

Drawings, Sheets

1/9-9/9 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).
- (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-14
	No: Claims	
Inventive step (IS)	Yes: Claims	10
	No: Claims	1-9,11-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

- 2. Citations and explanations**
- see separate sheet**

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Re Item V

Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V.1 Reference is made to the following document/s/:

- D1: WO 99 55600 A (3M INNOVATIVE PROPERTIES CO) 4 November 1999 (1999-11-04) cited in the application
- D2: DE 39 37 460 A (DAIMLER BENZ AG) 8 November 1990 (1990-11-08)
- D3: WO 89 03274 A (AKAD TEKN VIDENSKABER) 20 April 1989 (1989-04-20)
- D4: WO 00 69594 A (US ENRICHMENT CORP) 23 November 2000 (2000-11-23)

V.2 The present application does not meet the requirements of Article 33(1) PCT, because the subject-matter of claims 1,11-14 does not involve an inventive step in the sense of Article 33(3) PCT.

V.2.1 Document D1, which is considered to represent the most relevant state of the art, discloses a method for providing a hole into a valve component having an internal cavity by punching (preferably a valve stem (claim 2 and 3)) from which the subject-matter of claim 1,(2,3) differs in that the method for providing the hole is performed by

- a) filling and sealing a fluid within said cavity *and*
- b) laser drilling the hole through the component into the internal cavity

In this way a hole is made without a large burr projecting inwardly into the cavity as is the case when the hole is punched.

However, these features have already been employed for the same purpose in a similar method for providing a hole into a cavity, see document D2, column 2, line 63 - column 3, line 42 (a fluid is flowing through a pipeline with a slight over pressure to avoid air bells, thereby is the spot back wall damage mentioned in

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example C of the description avoided). It would be obvious to the person skilled in the art, namely when the same result (avoiding burrs) is to be achieved, to apply these features with corresponding effect to a method according to document D1, thereby arriving at a method according to claim 1.

If the man skilled in the art should make a hole in a valve stem with only one outlet, he would use the method of D2 fill the stem with fluid through the outlet followed by sealing the outlet, as it would not be possible to make a flow with an overpressure through the stem.

The subject-matter of claim 1 does therefore not involve an inventive step (Article 33(3) PCT).

D3 and D4 show similar methods for providing holes into a fluid filled cavity of an injection needle (D3) or into an engine fuel injector (D4) by laser drilling.

V.2.2 The independent claims 11-14 relate to products obtainable or obtained by the method of claim 1 and 2. These products are known from D1 and are therefore also not inventive according to Article 33(3) PCT.

V.3 Dependent claims 2-9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

V.3.1 with reference to claims 2 and 3
see V.2.1

V.3.2 with reference to claims 4-9:
The features of these claims are basically known from D1 (claims 4-7 and 9) or from combining D1 and D2 (claim 8).

V.3.3 with reference to claim 10:
The features of this claim seem to be inventive as none of the documents cited in the search report or in the description show these features and it is not obvious for the man skilled in the art to apply these features to the method for providing a hole according to document D1.